Investigation of Periphyton as an Environmental Indicator for Delta Tributaries

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Public Comments

No public comments were received for this proposal.

Collaboration Panel Review

Proposal Title

#0312: Investigation of Periphyton as an Environmental Indicator for Delta Tributaries

Final Panel Rating
adequate

Collaboration Panel (Primary) Review

Collaboration:

Will the results of the collaborative effort be greater than the sum of its parts? Is it clear why the subprojects are part of a larger collaborative proposal rather than several independent smaller ones?

above average
Collaboration with volunteer citizen groups is essential to the success of this proposal. Similarly, the involvement of agency personnel is essential in the evaluation of the previously−collected data. The result is a product that is clearly greater than the sum of its parts.

Interdependence And Integration:

Does the proposal have an example that clearly articulates the conceptual model of each subproject and how they link together as a whole? Are the boundaries of the study plans focused and cohesive, yet well delineated? Is there a plan for potential differences in the stages of subproject completion times? Are there clear plans for analyses and interpretations which seek to identify and quantify relationships among the data collected in various subprojects rather than separate analyses for each subproject?

adequate
A conceptual model of periphyton as an environmental indicator is presented in the Project Description and Background section (page 3). The sub−tasks are clearly delineated. No plans are presented to address differences in the projected sub−task completion dates.

Project Management:

Is it clear who will be performing management tasks and administration of the project? Are there resources set aside for project management and time given for investigators to collaborate? Is there a process for making decisions during the course of the project? Are there acknowledgments of potential barriers to collaboration and explanations of how team members will overcome barriers particular to their institutions?

adequate
Personnel assigned to the various tasks are identified in various locations in the proposal. No process is identified for making interim decisions nor how to overcom barriers to collaboration.

Team Composition:

Does the lead principal investigator have successful management history and experience leading collaborative teams? Is it clear that all key personnel are committed to making significant contributions to the project? Do team members have complementary skills?

adequate
The Lead Investigator has had experience in one similar collaborative effort. Key personnel appear to have the necessary skills to accomplish their assigned tasks.

Communication Of Results:

Is there a clear plan for comprehensive and cohesive reporting of project progress to the CALFED community?

adequate
The plan to communicate the results to CALFED is described. A component of each task includes report(s) preparation. Funds and staff responsible for the preparation of the reports are identified in the Tasks and Budget forms

Additional Comments:

Collaboration Panel (Discussion) Review

Primary reviewer notes that the proposal was the only one that used citizen volunteer participation as part of the collaboration. Although this was a bonus, the overall rating given (and ratings for each category other than collaboration) was Adequate.

Secondary reviewer scores for each category were one higher than primary's scores, but also gave an overall rating gave a rating of Adequate. Why? Felt that citizen monitoring groups were unique along with UCD and agencies, but had little information management and decision–making structure, and in light of working with the public, it may not be a good mix of plans and may produce uncertain results.

Technical Synthesis Panel Review

Proposal Title

#0312: Investigation of Periphyton as an Environmental Indicator for Delta Tributaries

Final Panel Rating
adequate

Technical Synthesis Panel (Primary) Review

TSP Primary Reviewer's Evaluation Summary And Rating:

The project proposes to develop a technique to assess water quality based on periphyton density on rocky substrates. Will provide much interesting information on periphyton. This is a proposal with a lot of appeal, but not a high level of scientific rigor with respect to interpretation of periphyton growth and water quality. There will be training of volunteers as part of the project. Methods to be employed, potential use of data are all elaborated in the proposal and lead to an adequate evaluation. Assumptions of correlation between periphyton and water quality may not always be appropriate. Other variables, not water quality in nature, may exert strong influence over periphyton at different times of the year and at different places. The probability that this could result in a fast and easy assessment tool for describing water quality is small, but it will yield some data no matter what the result. It also will engage the public, which as always valuabe.

Additional Comments:

I have some concerns regarding grazing effects on the periphyton. Are there fauna that could limit the extent of periphyton when water quality conditions are idea. Could appear as if there were problems because periphyton disappear.

This certainly happens on soft bottom communities with respect to diatoms. Trained volunteers and a reliable model of the feasibility of using periphyton will be the product. The statistical rigor seems to insure that this will be reasonably complete at the end and establish whether periphyton can be reliability used as a fast eco−indicator. So many of these ideas have not worked out in the past, but the PIs provide a compelling case to give it a try. If it does work they will publish the basic method. If it does not, there will be a large data base detailing some interesting components of this system that should be publishable.

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Technical Synthesis Panel (Discussion) Review

TSP Observations, Findings And Recommendations:

This was a well written and very well integrated proposal that describes a feasible project; however, it may not produce useful results. The implied relationship between overall water quality and periphyton concentration is not always real and may be confounded by other variables. The two external technical reviewers rated this proposal as very good, but

their comments were not consistent with these ratings. These included critical comments regarding the utility of the project’s results. The panel had significant concerns regarding the likelihood that this proposed work would result in a rapid assessment tool that would be useful for decision makers. Thus, the proposal was rated as Adequate.

Technical Review #1

proposal title: Investigation of Periphyton as an Environmental Indicator for Delta Tributaries

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The overall goal of the project is to investigate the use of periphyton on rocky substrate as a cost−effective indicator of environmental conditions and impacts in rivers tributary to the Delta. A single hypothesis will be tested, “The growth of periphyton in Delta tributaries is in response to measurable environmental factors that are influenced by land and water management and when excessive can negatively impact in−stream aquatic communities and downstream (Delta) water quality.” Specific goals to test the hypothesis are: 1) “Investigate the use of ecological indicators to measure impacts of land and water management. 2) Use current scientific and statistical approaches to measure human impacts on waterway ecological condition the Bay−Delta watershed 3) Improve watershed group and community knowledge of ecosystem health and increase their capacity to be involved in land and water management decision−making.” The goals and hypotheses are clearly stated and consistent. However, it is unclear how the results of the project will be assessed for the use of periphyton as a cost−effective indicator. What are the**

	comparisons that will be made to assess cost−effectiveness? What are the costs of currently used environmental indicators? What would be needed to implement the widespread use of periphyton as an environmental indicator? **Given the importance of water management and the threats of upland development and other anthropogenic impacts on the rivers of the Sierra Nevada and its foothills that are tributary to the Delta, the proposed work is viewed as being timely and important.**
Rating	**very good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The PI's indicate that they have addressed SWRCB WMI and CALFED program goals of "restoring ecological health and addressing water management issues by working with communities at watershed scales". Their contribution towards this will be to provide information (data) necessary to make recommendations to water and land managers in the region. To the PI's credit they identify the involvement of the public in sampling as an important step in acceptance of the development of management policy. The PI's have done a good job of developing a conceptual model that shows the ecosystem process and attributes that are important to the study of periphyton as an environmental indicator. They intend to collect data regarding parameters that are important contributors in this model, as well as to assess the consequences of land and water management actions. Overall, the research project is well justified.**
Rating	

	very good

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The overall approach for the investigation of periphyton growth will consist of the following 1) an initial study (yr 1) of a variety of water−ways to measure the extent, amount and timing of growth and identification of periphyton species and 2) an in depth study of three waterways (with directed sites determined on the basis of the yr 1 study) in yrs 2 and 3. Specific sites will be selected using a stratified random design. The results obtained from the proposed work will definitely add to the current base of knowledge, including additional insights regarding the impact of human activities on periphyton. The project does not involve development of methodology, but rather draws on existing methodology for the specific purpose of studying periphyton as a possible environmental indicator. It is not clear exactly how decision makers will directly use the information obtained.**
Rating	**good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**The approach has been largely documented and is technically feasible. The criteria for study site selection have been described in detail, however the sampling intensity and timing would have benefited**

	from presentation in tabular form. It was difficult to determine exactly how many samples would be collected and analyzed for each project component in each year. The techniques to be used are well established and the investigators are experienced, so there should be no technical complications in sample analyses. The specific utilization of the trained volunteers and the QA/QC for the volunteer sample collection should be more fully detailed. The scale of the project might fall short in accomplishing the overall objective of using periphyton as an environmental indicator, particularly if there are any problems encountered during either of the two intensive field−sampling years. Nevertheless, useful information should still be obtained.
Rating	**very good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**In general the monitoring program appears to be appropriately designed. It seems that all of the critical pieces for the monitoring program have been thought of and addressed, however it was a bit difficult to extract this information from the text. Presentation of this information in a well laid out table would have helped make the monitoring design much clearer. The description of the statistical methods to be used to analyze the data is well described and appropriate.**
Rating	**very good**

Products

Are products of value likely from the project? Are contributions to larger data management

systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**A product from the proposed project includes the annual reports to CALFED. Another set of products will be the data collected from the proposed work, along with the statistical analyses of correlations among indices of aquatic community and landscape and water management conditions. These data will be scientifically published in peer−reviewed science journals and will be the primary mechanism for release of the methods, results and conclusions. Results will also be presented at scientific meetings. The authors indicate that the reports, presentations and articles will be made available on the principal investigator's website at UC Davis and/or a CALFED website. Another final product that has been listed is to have 20 trained citizen monitors and 2 trained monitoring program staff. It does not appear that a database of the information collected from the proposed work will be developed and available to the general public. It is indicated that "where appropriate and invited, the project investigator will present finding to regional watershed groups, stakeholder groups, and CALFED Sub−committees". The authors indicate that the "project will improve watershed group and community knowledge of aquatic ecosystem health and increase their capacity to be involved in land and water management decision−making", however there does not seem to be a plan that specifically addresses dissemination to these groups unless they are invited.**
Rating	**good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The project will be led by two PI's, Dr. Shilling (Staff Research Associate IV) and Dr. Grosholz (Associate Specialist in Cooperative Extension) both in the Department of Environmental Science and Policy at UC Davis. Dr. Shilling is an aquatic ecologist who has studied a wide range of ecosystem processes in the context of science-based decision-making. He has published in relevant areas with a total of 24 publications (not all in peer reviewed journals). Dr. Grosholz is an aquatic and estuarine ecologist, who has also published in relevant areas, with a PNAS article on biological invasion in press. The PI's have assembled a highly qualified project team to carry out the proposed work. Team members bring expertise in the areas of freshwater macroinvertebrate taxonomy, periphyton bioassessment; sources and fates of DOC, and water chemistry analyses. Additional team members include Jill Andersen (Watershed Coordinator for the El Dorado County and Georgetown Divide Resource Conservation Districts) and Jeff Opperman (South Yuba River Citizens League Science Program Manager) who will assist in training of volunteers in periphyton, BMI, and environmental data collection; coordinate volunteer sampling and transfer data to UCD.** **Overall, the qualifications of the project team are excellent to carry out the proposed work.** **The facilities at UC Davis were not described in terms of research vessels, etc. Based on past work I would assume they are in place, however it would have been beneficial to have them identified. The infrastructure at the locations of the sub-contractors to carry out the proposed work appears to be very appropriate.**
Rating	

	very good

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	The assessment of the budget for the proposed work is difficult in some instances since the budget justification did not include things such as “estimated hours and hourly rate of compensation”. Also the overall benefit rate (%) was not indicated. In regards to travel, only a generalized description was included. It is also somewhat unclear why the nutrient and chl a analyses being carried out by Bucknell would cost $80,910 whereas the periphyton assessments (including algal taxonomy, soft-bodied algae and diatom ID/enumeration) will only cost $27,000. While the budget has been broken down into tasks, it would have been helpful if there also were either a specific timeline or a breakdown by year.
Rating	fair

Overall

Provide a brief explanation of your summary rating.

Comments	The proposed work includes the monitoring, sample collection and analyses and statistical analyses of data obtained. It also includes dissemination of this information. The PI’s and sub-contractors are well qualified to carry out the proposed work. I have no doubt that there will be important accomplishments towards the overall goals. Nevertheless, the proposal would have benefited from a clearer presentation of the monitoring program. The specific role and extent of the volunteers in collection of the samples is not as clearly

	defined as it could be. While useful information will certainly be derived, the program falls short in explicitly describing how it will translate into the use of periphyton as a cost-effective environmental indicator in Delta Tributaries.
Rating	**very good**

Technical Review #2

proposal title: Investigation of Periphyton as an Environmental Indicator for Delta Tributaries

Review Form

Goals

Are the goals, objectives and hypotheses clearly stated and internally consistent? Is the idea timely and important?

Comments	**The goals of this research project are stated clearly, and are internally consistent. The idea or hypothesis is timely. The importance of it lies in that the more information that is available for adaptive management decisions, the better. Assessing water quality where such a large number of variables exist is a daunting task, however the author has a specific plan that appears to be well−thoughtout.**
Rating	**very good**

Justification

Is the study justified relative to existing knowledge? Is a conceptual model clearly stated in the proposal and does it explain the underlying basis for the proposed work? Is the selection of research, pilot or demonstration project, or a full−scale implementation project justified?

Comments	**The research is justified, however my concern is in the strength of the results and how they may be applied elsewhere. Water quality issues and measuring degrees of impairment are quite challenging given the number of possible variables. I do beleive though, that this project is clear in its goals and justification.**
Rating	**good**

Approach

Is the approach well designed and appropriate for meeting the objectives of the project? Is the approach feasible? Are results likely to add to the base of knowledge? Is the project likely to generate novel information, methodology, or approaches? Will the information ultimately be useful to decision makers?

Comments	**The approach is well thought out, highly scientific, and will provide useful information in the end. The futher applicability is uncertain, only such research will be able to tell. The site selection for the study is well done and should increase the chances of a successful project. Building upon exisintg/previous data is quite useful as is utilizing gaged sites where possible. The proposal does indicate a very thorough list of analyses that will completed. This increases the difficulty of such research, yet provides more useful information in the end.**
Rating	**very good**

Feasibility

Is the approach fully documented and technically feasible? What is the likelihood of success? Is the scale of the project consistent with the objectives and within the grasp of authors?

Comments	**The scale of the project is manageable and appropriate for the approach described. I am unsure as to likelihood of success given my inexperience with some of the statistical methods they will employ. The timing of the sampling is well-considered and should make the data collection easier. The duplication of intensive study seasons should provide (as stated) a much greater richness of data for the analyses.**
Rating	**very good**

Monitoring

If applicable, is monitoring appropriately designed (pre−post comparisons; treatment−control comparisons)? Are there plans to interpret monitoring data or otherwise develop information?

Comments	**Typically I would not recommend volunteer groups as additional data collectors due to quality control issues, however, the author seems to have access to highly trained and competent group of individuals to assist in the long−term monitoring.**
Rating	**very good**

Products

Are products of value likely from the project? Are contributions to larger data management systems relevant and considered? Are interpretive (or interpretable) outcomes likely from the project?

Comments	**I very much like the reference to adaptive management as a instigator for the project and feel that the results of the study will likely aid in such management decisions. I do beleive that the study will produce products of value. Lengthening the study with additional funding once this portion is complete would provide even more useful products and decrease the likelihood of unusual conditions altering the data set.**
Rating	**very good**

Additional Comments

Comments

Capabilities

What is the track record of authors in terms of past performance? Is the project team qualified to efficiently and effectively implement the proposed project? Do they have available the infrastructure and other aspects of support necessary to accomplish the project?

Comments	**The project team appears to be highly qualified and competent based on previous work and education. The appropriate people seem to be "on board".**
Rating	**very good**

Budget

Is the budget reasonable and adequate for the work proposed?

Comments	**It appears so.**
Rating	**very good**

Overall

Provide a brief explanation of your summary rating.

Comments	**My overall rating of this proposal is "very good" and I believe that the author and other participants will provide useful results through this very thorough and highly scientific methodology.**
Rating	**very good**